

ANCHIT MISHRA

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Waterloo, Ontario

EDUCATION

University of Waterloo

M.Math. Computer Science (Thesis)
David R. Sheriton School of Computer Science
Advisor: Prof. Oliver Schneider

expected 2024

Grade: 94.3%

University of Hong Kong (HKU)

B.Eng. Computer Science (First Class Honors)
Faculty of Engineering
Advisors: Prof. Giulio Chiribella, Prof. Kenneth Wong

2022

GPA: 3.95/4.30

Indian Institute of Information Technology, Guwahati

B.Tech. Computer Science Engineering
Transferred to HKU

2019

CPI: 10.0/10.0

RESEARCH INTERESTS

My primary research interests lie in applying techniques from machine learning to develop intelligent design interfaces that support creative work for multimodal applications, spanning vision, audio and haptics.

In my free time, I also enjoy learning about methods in physics-based animation and physically-based rendering.

RESEARCH EXPERIENCE

University of Waterloo

Generative Design for Mid-Air Haptics - supervised by Prof. Oliver Schneider

Waterloo, CA

Sept 2022 - Present

- Developing an interactive drawing tool to aid the design of haptic effects (applied to mid-air haptics)
- Creating a dataset with the aim of providing a robust library for data-driven haptics research.

University of Hong Kong

Spinal Deformity Detection - supervised by Prof. Kenneth Wong

Hong Kong

Sept 2021 - Apr 2022

- Final year capstone research project conducted in collaboration with the HKU Vision Lab and the HKU AIMed Lab.
- Developed deep learning models to identify spinal deformity from biplanar X-ray scans.
- Implemented a modified version of UNet to perform semantic segmentation from a small X-ray scan dataset.
- Created a visualization tool using VTK to reconstruct a 3D view of the spine from orthogonal X-ray perspectives (anterior-posterior and lateral) and semantic segmentation maps.

University of Waterloo

The Haptiverse Platform - supervised by Prof. Oliver Schneider

Waterloo, CA

Jun 2021 - Aug 2021

- Designed and implemented a web-based data platform known as the Haptiverse for sharing and reuse of haptic assets between researchers and professionals.
- Also collaborated on a project with the aim of developing generative models for haptic feedback, and extended it to a master's thesis (in progress).

- An early alpha of the Haptiverse platform is accessible here.

University of Hong Kong

Hong Kong

Measuring Quantum Incompatibility - supervised by Prof. Giulio Chiribella

Jan 2021 - Aug 2021

- Co-developed a measure of Quantum Incompatibility known as Mutual Eigenspace Disturbance (MED) - constructed proofs for bounds, robustness to noise, and generalization from two to n measurements based on MED.
- Programmed simulations on IBM Qiskit to test out computational procedures using MED.
- Implemented K-Medoids clustering in Python(SKLearn) using MED as the distance function to demonstrate a novel machine learning application.

TEACHING EXPERIENCE

University of Waterloo

Waterloo

Teaching Assistant - CS349: User Interfaces

Jan 2023 - Present

- Conducting weekly office hours to clarify students' doubts.
- Grading assignments and exams for the course as well as handling rebuttals.

University of Waterloo

Waterloo

Teaching Assistant - CS135: Designing Functional Programs

Sept 2022 - Dec 2022

- Graded assignments and exams for the course.
- Helped students resolve doubts with the material.

University of Hong Kong

Hong Kong

Student Teaching Assistant - COMP2396: Objected Oriented Programming

Sept 2021 - May 2022

- Provided assistance in the form of tutorials for students to understand the material better.
- Assisted in grading of assignments as well as handling rebuttals for assignment grades.

University of Hong Kong

Hong Kong

Student Teaching Assistant - ENGG1340: Computer Programming II

Sept 2020 - May 2021

- Organized tutorials for students of the course.
- Mentored a group of 15 students and guided their course project development process.
- Assisted in grading of assignments as well as handling rebuttals for assignment grades.

HONORS AND AWARDS

1. Mitacs Globalink Graduate Fellowship (2022-23): CA\$15,000 awarded to outstanding former Mitacs Globalink Research Internship alumni pursuing graduate studies in Canada.
2. International Master's Award of Excellence (2022-23): CA\$2,500 awarded to outstanding international students commencing studies at the University of Waterloo.
3. Dean's List (2019, 2020, 2021, 2022): Awarded to top 10% of students in the undergraduate engineering cohort at the University of Hong Kong.
4. Runner-up at Google Travel and Voice Hackathon (2020): Developed Columbus, a Google Assistant application for planning itineraries based on route taken, duration of trip and other parameters.

PUBLICATIONS

Ning Gao, Dantong Li, **Anchit Mishra**, Junchen Yan, Kyrylo Simonov, and Giulio Chiribella. 2023. Measuring Incompatibility and Clustering Quantum Observables with a Quantum Switch. *Physical Review Letters* 130, 170201.

CONFERENCES

World Haptics Conference 2021 (attended) - Funded by the MITACS Globalink Research Internship program.

PROFESSIONAL EXPERIENCE

OliveX

Intern - Machine Learning Engineer

Cyberport, Hong Kong

Dec 2020 - Jan 2021

- Developed machine learning pipelines for research and development use.
- Set up an end-to-end pipeline for data scraping, storage and annotation on Amazon Web Services (Lambda + S3 + Sagemaker)
- Implemented an image scraper using Selenium and Google Chrome (headless)

Thabit Technologies Ltd.

Intern - Software Engineer

Noida, UP, India

Jun 2019 - Sept 2019

- Developed 3D graphical assets to be used for web portals.
- Used DAZ Studio and Blender for light baking and design.
- Wrote code in WebGL and Three.js to render the assets to the web browser viewport.

RELEVANT COURSEWORK

1. Computer Science

Algorithms, Artificial Intelligence, Machine Learning, Reinforcement Learning, Applied Deep Learning, Computer Graphics, Physics-based Animation, Human-Computer Interaction, Haptic Computing

2. Mathematics

Discrete Mathematics, Linear Algebra, Calculus I, II and III, Ordinary Differential Equations, Probability Theory

SKILLS

Programming Languages:

C/C++, Java, Python, HTML/CSS, Javascript (basic), LaTeX.

Frameworks/Libraries:

Pytorch, OpenGL, Polyscope, Eigen, Qt.

Development Tools:

Unix, AWS (Lambda, DynamoDB, S3, SQS, EC2), Git.

Creative Tools:

Blender, Houdini.